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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/683,534	10/10/2003	Lawrence S. Melvin III	SNPS-0524	2616

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EXAMINER	
PIERRE LOUIS, ANDRE	
ART UNIT	PAPER NUMBER
2123	

DATE MAILED: 09/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	**Application No.** 10/683,534	**Applicant(s)** MELVIN, LAWRENCE S.	
	Examiner Andre Pierre-Louis	**Art Unit** 2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.
2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-35* is/are pending in the application.
  4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) *1-35* is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☒ The drawing(s) filed on *10 October 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.
  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
  Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
  a)☐ All b)☐ Some * c)☐ None of:
    1.☐ Certified copies of the priority documents have been received.
    2.☐ Certified copies of the priority documents have been received in Application No. _____.
    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
  * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
  Paper No(s)/Mail Date *10102003,03312006*.
4) ☐ Interview Summary (PTO-413)
  Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-35 have been presented for examination.

Drawings

2. The drawings are objected to because they unlabeled square or rectangular boxes, more specifically fig.6, 7,9. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement-drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the examiner does not accept the changes, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3.0 Claims 3,5,14,16,25, and 27 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

3.1 Regarding claims 3,5,14,16,25, and 27, the phrase inside the parentheses renders the claims indefinite because it is unclear to the examiner whether or not the phrase/limitations are part of the claimed invention. See MPEP § 2173.05.

Claim Rejections - 35 USC § 101

4. 35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The claimed invention as a whole must accomplish a practical application. That is, it must produce a "useful, concrete and tangible result." State Street, 149 F.3d at 1373, 47USPQ2d at 1601-02. The purpose of this requirement is to limit patent protection to inventions that possess a certain level of "real world" value, as opposed to subject matter that represents nothing more than an idea or concept, or is simply a starting point for future investigation or research (Brenner v. Manson, 383 U.S. 519, 528-36, 148 USPQ 689, 693-96); In re Ziegler, 992, F.2d 1197, 1200-03, 26 USPQ2d 1600, 1603-06 (Fed. Cir. 1993)). Accordingly, a complete disclosure should contain some indication of the practical application for the claimed invention, i.e., why the applicant believes the claimed invention is useful. However, the mere fact that the claim may satisfy the utility requirement of 35 U.S.C. 101 does not mean that a useful result is achieved under the practical application requirement. The claimed invention as a whole must produce a "useful, concrete and tangible" result to have a practical application.

4.1 Claims 1-35 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The claims do not produce a useful, tangible, concrete result. **See MPEP 2106 [R2].**

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5.0 Claims 1-35 are rejected under 35 U.S.C. 102(e) as being anticipated by Zhang et al. (USPG_PUB No. 2003/0061587).

5.1 In considering the independent claims 1,12,23,34, and 35, Zhang et al. discloses the functional equivalence of a method for dissecting a layout of an integrated circuit based on modeled intensity gradients to produce a segmentation for an optical proximity correction (OPC) process, and particularly teaches the steps of: receiving the layout for the integrated circuit *(see abstract, fig.5, pg.3 (0048-0049))*; performing a model-based simulation on the layout to generate intensity gradients along edges of features in the layout (*see fig.5, pg.3-4(0048-00059)*); and generating a segmentation for edges in the layout based upon the intensity gradients, wherein the segmentation is used by a subsequent OPC process in generating corrections for the layout *(see fig.4-5, pg.1-2(0009-0012 and 0029-0034)).*

5.2 As per claims 2,13, and 24, Zhang et al. teaches that the step of generating the segmentation involves: determining segment lengths for edges in the layout based upon the intensity gradients along the edges *(fig.4-5, pg.2 (0029-0034));* and using the segment lengths to dissect the edges in the layout, thereby generating the segmentation for the layout *(fig.5, pg.3-4 (0048-0059)).*

5.3 With regards to claims 3,14, and 25, Zhang et al. teaches that identifying a segment length for an edge involves using a predetermined association to map an intensity gradient angle (and possibly magnitude) to the segment length *(fig.4-5, pg.2-3 (0029-0034 and 0048-0059)).*

5.4 Regarding claims 4,15, and 26, Zhang et al. teaches that generating the segmentation involves selecting a segmentation for a line-end in the layout from a set of predetermined line-end segmentations based upon intensity gradients associated with the line-end *(fig.5, pg.3 (0048-00590 and 0039-0040)).*

5.5 As per claims 5,16, and 27, Zhang et al. teaches that the segmentation for the line-end is selected based upon a magnitude (and possibly angle) of an intensity gradient associated with the line-end *(fig.4-5, pg.1-2 (0009-0012 and 0030-0034)).*

5.6 With regards to claims 6,17, and 28, Zhang et al. teaches that performing the model-based simulation on the layout involves: dividing each edge in the layout into minimum-sized segments *(fig.4-5, pg.1-2 (0009-0011 and 0030))*; and performing a model-based simulation to determine an intensity gradient for each minimum-sized segment *(fig.4-5, pg.1-2 (0009-0012 and 0030-0034)).*

5.7 Regarding claims 7,18, and 29, Zhang et al. teaches that determining a gradient for a given minimum-sized segment involves performing a model-based simulation at two tangential points along the segment to determine a tangential component of the gradient *(fig.5, pg.3 (0048-0059))*.

5.8 As per claims 8,19, and 30, Zhang et al. teaches that determining the gradient for the given minimum-sized segment involves performing a model-based simulation at two points along a normal to the segment to determine a normal component of the gradient *(fig.4-5, pg.3 (0048-0059))*.

5.9 With regards to claims 9,20, and 31, Zhang et al. teaches the step performing the dissection again on problem areas in the layout after initial OPC operations take place *(fig.5, pg.3 (0048-0059))*.

5.10 Regarding claims 10,21, and 32, Zhang et al. teaches the step reducing the number of segments in areas that prove to be simpler to correct than predicted after initial OPC operations take place *(fig.4-5, pg.1-2 (0002-0012 and pg.3 (0048-0059))*.

5.11 As per claims 11,22,33, Zhang et al. teaches prior to receiving the layout, the method further comprises calibrating the association between gradients and segment lengths by: modeling an intensity gradient across a test pattern *(fig.4-5, pg.1 (0011, pg.3 (0048-0059))*; identifying target regions in the test pattern that have a large amount of correction shift variation *(pg.1-2 (0009-0012 and pg.3 (0030-0034))*; mapping intensity gradients to the target regions *(pg.1-2 (0009-0012 and pg.3 (0030-0034))*; associating segment lengths with the target regions *(pg.1-2 (0009-0012 and pg.3 (0030-0034))*; and producing an association between intensity gradients and segment lengths in the target regions, whereby the association is subsequently used in generating the segmentation for the layout *(fig.4-5, pg.1-2 (0009-0012 and pg.3 (0030-0034)).*

6. Claims 1,12,23,34, and 35 are further rejected under 35 U.S.C. 102(e) as being anticipated by Liu (U.S. Patent No. 7,082,596).

6.1 Regarding claims 1,12,23,34, and 35, Liu discloses the functional equivalence of a method for dissecting a layout of an integrated circuit based on modeled intensity gradients to produce a segmentation for an optical proximity correction (OPC) process, and particularly teaches the steps of: receiving the layout for the integrated circuit *(see abstract, fig.3, col.1 line 54-col.2 line 28)*; performing a model-based simulation on the layout to generate intensity gradients along edges of features in the layout (*see fig.4, col.3 line 3-col.4 line 54)*; and generating a segmentation for edges in the layout based upon the intensity gradients, wherein the segmentation is used by a subsequent OPC process in generating corrections for the layout *(see fig.4, col.3 line 3-col.4 line 54).*

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

7.1 Mukherjee et al. (U.S. Patent No. 7,043,712) teaches a method and adaptive segment refinement in OPC.

7.2 Cobb (U.S. Patent No. 7,024,655) teaches a mixed-mode OPC.

7.3 Capodieci (U.S. Patent No. 6,978,438) teaches an OPC techniques using generalized figure of merit for photolithographic processing.

8. Claims 1-35 are rejected and this action is non-final. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andre Pierre-Louis whose telephone number is 571-272-8636. The examiner can normally be reached on Mon-Fri, 8:00AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul L. Rodriguez can be reached on 571-272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

September 21, 2006

APL

9/24/06

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